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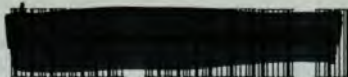
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NORTH CAROLINA GEOLOGICAL AND ECONOMIC SURVEY

JOSEPH HYDE PRATT, DIRECTOR

FORESTRY DIVISION

J. S. HOLMES, STATE FORESTER

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CIRCULAR No. 1

THE FOREST PROBLEM

IN

NORTH CAROLINA

BY

W. DARROW CLARK
CHIEF FOREST FIRE WARDEN

HELP PREVENT FOREST FIRES—IT PAYS



1922
CHAPEL HILL, N. C.

Meeting Dept.
Lipp
No. Carolina Geol. & Econ. Survey
Forest Div.
5-6-1929

THE FOREST PROBLEM IN NORTH CAROLINA

EARLY STAGES OF FOREST EXPLOITATION

The importance of preserving a thrifty local forest growth is never fully appreciated in any country until through exploitation and destruction by fire the supplies become so diminished that a threatening scarcity is apparent.

The process of exploitation in all countries has been similar. In our country the original settlers found a wealth of forest growth unsurpassed in variety and quality in any part of the world. The supply was so abundant that it was at first considered an encumbrance on the land. Before the land could be tilled it was necessary to clear it by arduous toil. There was no dynamite to blow the stumps, no machinery to saw the magnificent logs into lumber shapes, and there was no available market in which to dispose of it even if it could have been manufactured. As their way out of such difficulties they held their log-rolling parties, at which these logs were rolled into huge piles, the fire kindled and the logs burned.

Then followed the skimming of the cream of the forest for building and manufacturing purposes. The choicest logs of black walnut, cherry, red birch, yellow poplar, oak and pine were cut and hauled to market, and the owner thereof was fortunate if he received enough to barely cover the value of the labor of himself, his employees, and his team, allowing nothing for the intrinsic value of his logs. Were not his logs a gift from Mother Nature? He did not plant them nor care for them, but found them ready grown, ripe for the axe and the saw.

FORESTS AND LUMBERMEN

Much blame for our deforested condition is thrown at our lumbermen.

It is no purpose of this discussion to hold a brief for any mistakes of the lumbermen. It is rather an attempt to point out the true underlying cause of ruthless forest exploitation, placing the blame where it honestly belongs, to the end that we may find an adequate solution of the very serious problem of forest restoration that confronts us.

Lumbermen did not create the enormous demand for their wares. This demand originated in the God-given impulse within mankind for progress and development. The lumbermen have been the instrument through which the demand has been supplied. They have been the experts in the conversion of trees into lumber shapes for building the homes which fill our land and make it bloom; for the construction of

Not done - say
railroads and bridges, ships and piers to transport all necessary supplies, and to distribute to their various markets the produce of farm and factory.

The lumbermen supplied the raw materials for manufacturing furniture, farm implements, vehicles, boxes, crates, paper pulp, musical instruments, toys, and all other articles made from wood. They have built their rail and tram roads, their flumes and sled roads into the wild and inaccessible places from our loftiest mountain tops to the lowest swamps. They have bridged the canyons and hurled steel cables from tail to spar and made the huge logs yield to irresistible force. By the application of powerful and wonderfully designed machinery they have gathered the raw products of the forest, converted them into usable shapes, and distributed them to our local marts for further fabrication. Their spirit of adventure, courage, hardihood, hazardous risks for large capital, able management and skill have never been exceeded in any line of endeavor by any race of men. The countries of the world have sent their agents to them for instruction in the harvesting of forest crops.

He has succeeded most in the lumber industry who has been able to supply best and at lowest cost what the consuming public has demanded. Keen competition and hazardous risks of large investments have threatened him with financial ruin and many there have been who failed. Mere self-preservation has been the restraining force keeping the woods operator from conducting selection cuttings, from leaving seed trees, from providing adequate protection against forest fires and from carrying on all other methods advocated for the public interest and for future generations. Such measures necessitate scattered logging over extensive areas and could have been adopted only at increased costs all along the line. One operator could not incur such expenses unless all operators would do the same. One operator could not increase the price of his product in order to cover such increased costs unless his competitor would do likewise. Every purchaser of lumber has sought the cheapest market. What purchaser ever stopped to inquire as to whether the price he was about to pay for his lumber would justify the manufacturer in taking steps to insure a new crop of trees on the cut-over area? If the operators made any attempt to unite for the purpose of increasing their selling price they received a quick call from the guardians of the Sherman anti-trust law. That they were between an upper and nether millstone in this matter is perfectly clear. The point which should be appreciated is that the cost of growing timber as a crop has never been included as a factor in determining the selling price of lumber. To what extent the cost of growing timber should govern the cost of lumber in the future is a mooted question. But that we must have future forests, and that we all must pay in some way or other for the growing of them, is beyond dispute.

EXTENSIVE EXPLOITATION ACCOMPANIES RAPID DEVELOPMENT

The amazing development of the American lumber industry, which we have feared at times to be outstripping our natural forest resources, has developed independent of human control just as other industrial and economic forces develop independent of human control and even in spite of attempted control.

Our country could not have developed as it has except for the very liberal use which has been made of the wonderful natural resources with which it was endowed. But this in no way excuses or justifies wanton waste or disregard for future supplies of such resources as are renewable and necessary.

The cut of timber in North Carolina reached its peak in the year 1909, with a total of four billion feet, board measure. Since that year the cut steadily decreased with the rapidly vanishing supply until in 1919 the total cut was approximately two billion feet.

The original yellow pine area of North Carolina is estimated at 10,000,000 acres, and of this original stand it is estimated that just 500,000 acres remain uncut.

For hardwood lumber the entire United States is dependent principally upon the Southern Appalachian region, and yet here also a very small percentage of the original stand of hardwood in North Carolina remains. It is estimated that within twenty years this remainder will have been cut.

In 1909 North Carolina stood fourth in relative rank of the states leading in the production of lumber. In 1918 North Carolina stood tenth in the same rank.

These figures indicate not only the rapidity with which our forest resources have been utilized, but they also indicate the vast extent of cut-over land which must be kept in a continuously productive condition in order to meet our needs for forest products.

Our people are now beginning to realize that much should have been done to reestablish and to protect forests where the old ones were utilized. But both forest production and forest protection are too long an undertaking, and too broad and complicated by too many factors difficult of control for any one class of individuals, or any one class of industries, to handle them successfully.

The active and intelligent support of all the people is just as essential in this task as it is in the task of stamping out disease, crime, vice or extravagance in any form. Until we begin to work on that basis we are doomed to failure.

FIRE AND DESTRUCTION FOLLOWS IN THE WAKE OF EXPLOITATION

So the cream of our forests has been repeatedly skimmed until today cream, skim milk and practically everything has taken on some value.

But this process could not work out other than one of continuous degeneration of the forest. The best was selected for use, the inferior and worthless species were left to sow the seed of their kind in the openings made by the removal of the best. How rare today is a log that will produce clear walnut or cherry or poplar, and it will not be many years before a log that will produce clear lumber of any kind will be a rare commodity. But the most inexcusable of all is that the young growth which persisted in coming up in an effort to replenish the forest has been repeatedly burned back to the ground and compelled to make a new start. This has occurred again and again, until now we find that our forests are made up not only to a large extent of inferior species, but fifty per cent of the forest area is lying idle and open.

The total land area of North Carolina is approximately thirty-one million acres, of which about two-thirds, or twenty million acres, are at present devoted to forest growth. About one-fifth (four million acres) of the total forest area burned over during the decade 1910-1920, causing a property damage, conservatively estimated, at ten million dollars.

Such figures offer a sad commentary upon the manner in which we take care of an invaluable natural resource. The word invaluable is used in this connection, for who can correctly value all the indirect benefits which result from a healthy forest growth upon our mountain slopes and other nonagricultural land. The damage figures given above include simply the average market value of the products destroyed. As a matter of fact, the loss is much more than the value of these products. When fire destroys a growing forest it destroys a source of employment for local residents and for teams, especially during the winter period when other work is slack. It destroys local supplies of lumber for building and manufacturing purposes and of wood for fuel. It necessitates the importation of such products from more distant points, and additional charges for freight and haulage of same. The lack of local supplies of lumber is sure to drive away all sorts of industries which depend upon local wood supplies for their raw materials. This in turn reduces the local population, for it reduces local demand for labor. The reduction of population reduces local land values, and destroys the local market for farm products as well as other products.

FOREST FIRES REDUCE THE GROWING POWER OF THE SOIL

Every time the land burns over, a certain amount of humus—decayed vegetation in the soil—is destroyed and the productive power of the soil is reduced. Nature's enriching material goes up in smoke instead of down in the form of fertilizer. It makes no difference in this respect whether the land is destined to be cleared for pasture, corn,

cotton or other crops, or to remain in forest growth. Land which has been burned over repeatedly is unfitted for any kind of production until the humus has been restored to the soil.

FOREST FIRES AFFECT STREAM FLOW AND SOIL EROSION

Burning dries and bakes the soil and when the rains come the very soil itself is washed from our hill and mountain sides and the rocks come to surface. As a further result, surface run off of the rain water is accelerated and deep seepage diminished. The streams flow in torrents during the flood season, washing away the top soil of our fertile valley bottoms or depositing sand and other detritus over the surface, making reclamation laborious and costly. During the seasons of light rains streams dry up entirely or are reduced to a minimum. Forests on our mountain slopes are Nature's conservators of our rivers. In the absence of lakes they serve as natural reservoirs to hold back the exceptionally heavy rainfall of our Southern Appalachian region. They form a deep mulch over the surface of the ground, keeping the underlying soil porous. The rain in its fall, being checked by the tree growth, reaches the ground gently, is absorbed quickly by the leaf mulch on the surface, seeps down into the porous soil and then is fed out continuously through the deep springs to the rivers and the flow of the rivers remains equable. This forest influence is emphasized because our rivers are destined to become of importance second only to healthy, intelligent, moral and industrious people. Idle rivers, like idle land and idle people, mean lost production. Our wonderful waterpowers are going to be harnessed for work, and when they are so harnessed they will develop motive power to pull our trains, turn our wheels of industry, and light our cities and towns. Cheap power in any country is a key to industrial and economic supremacy.

FIRES DESTROY RECREATIONAL VALUE OF FORESTS

Our forests possess another important value. They help to maintain the inspiring charm of our country. They invite the tourist and all recreation seekers. The resorts of our lowland pine country afford havens of relief for our friends of the frozen northland during the winter season, and during the summer our mountain and seashore resorts invite those oppressed by the heat throughout the entire east and middle west. When the vast extent of country is considered which, with the development of good roads, will become accessible, one feels like predicting that the tourist business of North Carolina will surpass in profitableness the wildest dreams of Switzerland.

Forest fires destroy the recreational value of the forests. They drive away the birds, game and other wild life, and in consequence all manner of insect pests increase and work havoc on agricultural crops.

The evils of fire and deforestation may be summed up by saying that they destroy a balance of Nature as well as a balance of industry, and all intelligent people should lend their utmost support to measures designed to prevent and overcome them.

RECONSTRUCTION

What we must do now is to restore the forest. We must put our idle cut-over and burned-over forest lands to work producing new forest crops. That extensive areas are in a very unproductive condition is apparent to any one who has an opportunity to inspect them even in a broad way. The very first step in restoring their productivity is protection against fire. It is of no use to invest in young forest growth if it is destined to burn up before maturity.

Any form of wealth is worth protecting to the extent of its value. Insurance companies, as a rule, are quite willing to insure various forms of property to the full extent of its value, and the rates they charge for such insurance bear a direct relation to the risk involved. The practice of issuing insurance on standing timber or young forest growth has never been developed to any great extent in this country, although the proposition has been agitated more or less. One serious obstacle to such development has been the prohibitive rate which the great risk necessitates. In other words, the chances are so great that standing timber or young forest growth will be destroyed by fire, that no insurance company is willing to carry the risk except at so high a rate that the owner cannot afford to pay it. The reason insurance rates on town and city property are so low is that efficient efforts are made to prevent fires, and also to stop fires quickly when they do break out. Comparatively little has been done so far either to prevent forest fires, or to extinguish them quickly. Vigorous efforts along both these lines must be made. If frame structures are worth protecting against fire, surely the source of supply from which all timber is derived should be protected against fire.

THE STATE SURVEY DEVELOPING A FOREST WARDEN ORGANIZATION

We should never expect to get adequate forest protection without making it somebody's duty. It is just as important to have an organization for fighting fire and enforcing the law in the woods as it is to have one to fight fire and enforce the law in a town or city. Our forest warden organization is designed to institute and maintain law and order in the woods.

Our people have developed an amazing carelessness in letting fire escape. This applies to the city automobilist, the camper, hunter, or other pleasure seeker as strongly as it does to the rural dweller or mountaineer.

The dropping of burning matches, cigarettes, cigars or pipe contents where they come in contact with dry grass, brush, leaves or other inflammable material is a common act of carelessness limited to no one class of people. Hunters, fishermen, campers, farmers burning brush, rangers of cattle, nut gatherers, berry pickers, root and herb gatherers, engineers in charge of: railroad locomotives, logging road locomotives, steam log skidders and loaders, portable sawmills; in fact, every single handler of fire out-of-doors should step up and acknowledge his share of blame, and then all join hands in a solemn covenant to take every precaution in the future to prevent fire from escaping, and of shouldering their full responsibility in case they permit it to escape.

The forest fire problem is by no means solved with the establishment of a forest warden organization. Without universal support in preventing, detecting and extinguishing forest fires a few wardens in a county can accomplish but little. Creating public sentiment and concerted support in the prevention, detection and suppression of these fires is to be made the forest wardens' work. Just as soon as he can get all his people helping him to prevent fires and to detect fires as soon as they start, and to extinguish them quickly, his problem will be largely and automatically solved. Likewise, the more help and support the forest wardens receive from their people the less expense this forest protective organization will be to the county. They are not employed continuously but only during dry and dangerous periods, and then on a per diem basis.

The wardens will instruct the people in their district in regard to the very stringent laws which provide penalties for letting fire escape on to somebody's else land. They will carefully investigate the origin of all forest fires and it will be their duty to bring into court all parties found guilty of letting fire get away from control, as well as those who voluntarily set fire for any purpose whatsoever.

They will post throughout their districts warning notices, and notices offering rewards for evidence leading to the conviction of parties who allow fire to escape. They will request their people to report fires as soon as possible after they are discovered, in order that the wardens may get to them with a crew of fire fighters before the fire gains great headway. They will call at all rural schools and tell the children how forests grow and reproduce themselves, and how necessary it is to keep fire out of the woods in order that future generations may have forests and lumber supplies.

In brief, the duty of every forest warden is to reduce to a minimum the loss from forest fires in his district, and at a minimum of cost to his county and State. To this end, he will need to use all the ingenuity and tact he can command. There is no standardized way of accomplishing this endeavor. Conditions, both human and physical, are too complex and varying.

A strong effort is being made to obtain a public-spirited class of men to act as wardens, men who are interested in the welfare of their respective communities and who derive more satisfaction from accomplishing constructive reforms than from acquiring the highest possible daily wage. For that class of men the position of forest warden offers an opportunity worthy of all his courage, tact and ability.

*Every body
has a share*

The ideas that forest fires are inevitable, that they are bound to occur, that they do not do much damage anyway, and who cares, all must be counteracted. As a matter of fact, the primary cause of practically all of our forest fires lies in just such ideas. It is a self-evident fact that every one of us throughout life is a beneficiary, both directly and indirectly, of the forest. If every one of us could be thoroughly convinced of that, and also that forest fires are a willful waste, that they are not inevitable; that most of them are the result of rank carelessness; that it is no less than a crime to carelessly permit one to start; and, furthermore, that it is an urgent public duty for every one who sees a fire or hears of one to do everything reasonable within his or her power to help extinguish it, or at least to report it at once to those whose duty it is to extinguish it; then and not until then, will the loss from forest fires become merely nominal.

The establishment of such ideas is an educational process. The minds of our children constitute the most fertile soil for the reception of the seed. Forest protection should, therefore, be taught in the schools. Sunday schools, likewise, might very properly take it up. As forest fires are a willful waste, to that extent, it becomes immoral not to stop them. But the urgent need is to prevent these forest fires now, so we must not relegate this problem to our children. Our older generation also must be convinced. Accordingly, these principles should be spread broadcast through the daily press and through all widely distributed periodicals. They should be propagated by the moving-picture houses, thrown out from the lecture platform and pulpit, and by all other disseminators of beneficial ideas.

Along with the creating of sentiment must go the development of the organization and the acquisition and placing of equipment necessary to do the actual work required in the prevention, detection and extinguishing of the fires. Good men, efficient and well organized, are needed, and likewise, good equipment. Ultimately, every township should have at least one forest warden, and more according to its needs. Every group of townships, perhaps every county, should have its supervising warden, and every group of counties should have its district warden.

Every member of this organization should be accessible by telephone, especially during dry and dangerous periods. One of the secrets of success is to get reports of a fire as soon as it breaks out in order to get to it with a crew and equipment and fight it before it gains headway. Such equipment would include axes, saws, rakes, shovels, hoes, buckets, torches, and in some localities, chemical fire

extinguishers and Ford auto trucks. This equipment should be located so as to be quickly accessible whenever it should be needed. It should include a system of watch towers and cabins located on high points from which watchers could survey a wide expanse of territory and detect fires by the rising smoke as soon as they start. All cabins and towers should be connected by telephone lines and also with the forest wardens' headquarters, so that they could receive notification of fires immediately.

Such a forest protective system cannot be developed overnight. It grows and develops from small beginnings. A little development here and a little development there, then union and organization, until the entire forested area of the State is covered by a single closely cooperating organization.

Efficiency in this matter demands that it be carried out on the broadest possible plan. On a private basis the protective chain would be no stronger than the weakest link, and there certainly would be many and very weak links on the latter basis. Furthermore, the broader plan is designed to substitute universal concerted action for spasmodic individual action. It constitutes a big and broad way for meeting a big and broad situation.

THE NORTH CAROLINA GEOLOGICAL AND ECONOMIC SURVEY OFFERS TO COUNTIES CO-OPERATIVE AID IN EMPLOYING FOREST WARDENS

The Forestry Division of the State Geological and Economic Survey has been experimenting with these problems for a number of years. It is now felt that a solution is so close that a definite proposition can be presented to every forested county.

All the experimental work has been done at the expense of the State and National governments. The Survey now offers the counties a definite plan of organization on a fifty-fifty cost basis; that is, one-half of the expense to be borne by the counties, and the other half by the State and National governments under the provisions of the Federal Weeks Law.

Under the provisions of chapter 26 of the Public Laws of North Carolina, 1921, any county in the State may obtain a forest protective organization by appropriating a few hundred dollars to cover one-half of the cost. The actual amount will depend on the forest area of the county, together with all the factors bearing on the fire hazard, such as topography, ground cover, local inhabitants, roads, etc.

The other half will be paid by the Director of the Survey from funds provided for the purpose by the State and Federal governments. This offers at one-half cost to any county the opportunity of securing practical protection to one of its important resources. In fact, in many of the counties the forest area constitutes one of its chief, if not most

important assets. In such counties the chief source of future revenue may depend largely upon its success in securing continuous and thrifty forest growth upon its forest area.

Such a distribution of cost seems most just and equitable. The county is most vitally concerned in keeping its forest area productive. The State is concerned in making that condition State-wide, and the Federal Government is interested from a nation-wide point of view.

During the past summer the North Carolina Geological and Economic Survey has conducted a campaign throughout the eastern and western counties of the State for the purpose of crystallizing public sentiment in support of concerted action between the county, State and Federal governments to prevent and extinguish forest fires. The results of the campaign have been very encouraging in so far as it has established the fact that the entire public are almost unanimous in their conviction that the proposed plan of coöperation should be adopted.

The results of the campaign in getting definite county appropriations to cover their half of the expense have not been so encouraging. There seem to be several reasons for this situation. In the first place, although numerous business and farmers' organizations have gone on record as emphatically endorsing the plan, and such endorsements have been given extensive publicity and strong support by the newspapers, yet it appears that the boards of county commissioners are not convinced that such actions necessarily imply general public approval of the plan. In the second place, almost without exception the county treasury reserves are at a very low point and in many instances the county is in debt. For such reasons, the county boards should be commended for their careful guardianship of county funds.

From another point of view, the refusal by the county boards to appropriate funds to take care of one-half the cost of establishing a forest protective system coöperative between the counties, State and Federal governments seems to be a penny-wise and pound-foolish policy, a policy of saving at the spigot and wasting at the bung.

There is ample data to establish the fact that the cost of an effective forest protective system is a mere fraction of the value of the loss by fire where there is no protective system. In other words, a do-nothing policy is by far the most expensive policy, and in this case, owing to the very nature of forest growth and forest influences, the loss is strikingly accumulative.

The fact that the present state of county finance is not favorable for starting the work does not alter this situation at all. As the forest lands are one of the fundamental and basic assets of the county, it follows that the longer the county delays to take suitable action to stop the depletion of this asset by fire, the less able they will be to do so later on; and vice versa, the sooner they take steps to maintain the normal increase of forest growth, the greater will be their source of revenue for

any legitimate purpose whatever. The fact is, there is probably no county in the State so bankrupt that with reasonable effort it could not raise the few hundred dollars necessary for this purpose.

Can any county in the State whose forest area constitutes one of its fundamental basic assets afford to refuse such an offer of assistance in maintaining continuous forest production?

Yet experience proves that this proposition is not going to put itself into operation. It is going to require the active, energetic and organized efforts of intelligent and determined people. If your county needs forest fire protection and does not have it, get in touch with your board of county commissioners and learn the reason why. The Survey will always be glad to respond to any calls for advice and practical assistance.

There are one hundred counties in the State but only twelve first Mondays during the twelve months of the year on which the opportunities of coöperation in forest protection under the Federal Weeks Law and chapter 26 of the State Laws of 1921 can be presented to the county boards while in session. If, therefore, any county board is particularly interested in getting coöperative protection established quickly this may be accomplished if the chairman of the board will write to Colonel Joseph Hyde Pratt, Director of the North Carolina Geological and Economic Survey, Chapel Hill, North Carolina, requesting an interview, or endorsing the following proposed agreement:

**PROPOSED AGREEMENT FOR THE PROTECTION FROM FIRE OF
FOREST LANDS IN.....COUNTY, NORTH CAROLINA**

THIS AGREEMENT, made under authority of "An Act to Authorize Counties to Coöperate with the State in Forest Fire Protection," chapter 26, Public Laws of North Carolina, 1921, by the North Carolina Geological and Economic Survey, hereinafter called the Survey, party of the first part, and the Board of Commissioners of County, and State of North Carolina, hereinafter called the Board, party of the second part, witnesseth:

That, whereas, the said Board, recognizing the need for active forest fire prevention in County, has accepted the offer of the Survey for coöperation in accomplishing this object:

Now, therefore, the said parties promise and agree to maintain forest wardens at the joint cost of the State and the county, as follows:

1. The Survey agrees:

1. To employ said forest wardens during dangerously dry periods throughout the year for the purpose of protecting the forests of said county against fire; for detecting and extinguishing fires that break out; for investigating the origin of all forest and field fires and for enforcing all forest laws.
2. To pay the forest wardens for services rendered at a fair rate as soon after the end of each calendar month as final reports can be received.

